2017 ANNUAL WEATHER SUMMARY
FOR BAKERSFIELD, FRESNO, HANFORD, MADERA, AND MERCED

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Monthly Recap of Temperature and Precipitation Patterns During 2017:

January- Nuisance flooding was common, especially in urban areas. Record high precipitation was widespread (including snow in the Sierra Nevada). Quite a few flooding problems occurred in Merced and in locations in Madera and Merced Counties due to levee failures and water releases into creeks and rivers. Dense fog occurred during quiet weather periods, especially near Hanford towards the end of the month, or when high pressure set up over central California.

7th – 9th: Heavy rain and thunderstorms prevailed due to an atmospheric river (sometimes mentioned as "pineapple express") over the region. Flooding and debris flows occurred in the Sierra Nevada, especially around Bass Lake, North Fork, and in Yosemite National Park. Rainfall amounts reached one to two inches and locally higher in the San Joaquin Valley during this period.

18th – 22nd: A series of heavy rain storms and atmospheric rivers brought a threat of flooding to much of the region. Rainfall amounts exceeded 2 inches in many locations of the San Joaquin Valley and reached over 12 inches in the Sierra Nevada below 9,000-10,000 feet.

February- Another wet month occurred in the region, especially during the early and middle parts. More flooding problems occurred in Merced, mainly during the first week. Water releases were common in the rivers flowing into the San Joaquin Valley, especially for the first half of the month. Abundant snowfall continued in the Sierra Nevada. Dense fog was a problem in the San Joaquin Valley during quiet weather periods.

7th -10th: Atmospheric rivers brought heavy rain and flooding to Merced and Mariposa Counties. An earthen dam almost experienced complete failure near LaGrange (east of Merced) due to persistent heavy rain and thunderstorms.

March - This was generally a quiet month with above average temperatures. The storm track remained to the north of central California and provided a much needed break after very wet months since December 2016. At the end of the month (especially on the 30th) strong winds occurred in much of the San Joaquin Valley and caused numerous trees to fall because of saturated soil.

April – While the month was generally dry with near average temperatures, very heavy precipitation (almost two inches in one hour) fell in Fresno during the afternoon of the 13th, due to a strong, slow-moving thunderstorm in the vicinity of Fresno Yosemite International Airport. Otherwise, very windy periods occurred throughout the month, as is typical for the spring months.

13th: A strong, nearly stationary thunderstorm brought record rainfall, or almost two inches in the course of only one hour at and about a two to three mile radius from Fresno Yosemite International Airport. This resulted in severe street flooding and a traffic snarl on a Friday afternoon during the peak commute time.

May – The month was generally above average in terms of temperature. Large amounts of snowpack melted at times due to warmer than average temperatures during both the early and latter parts of the month. The Merced River at Pohono Bridge in Yosemite National Park experienced very high flows and minor flooding. The middle part of the month was generally cool with precipitation confined to mainly the Sierra Nevada and adjacent foothills. A few windy days occurred, including after passage of storm systems over the Pacific Northwest.

4th – The first triple-digit high temperatures in the San Joaquin Valley (including in Bakersfield) for the year were reported.

June – Well above average snowpack remained in the Sierra Nevada for at least the first half of the month. Quite a few days were cooler than average, especially during the second week of the month. However, over the course of the third and fourth weeks of the month, temperatures warmed greatly, and snowpack rapidly melted and caused an anomalously high amount of runoff into the reservoirs and main stem rivers. Record high temperatures were reported during the latter half of the month. This period was enough to bring temperatures above average for the month overall.

17th-26th: A ten-day period of triple digit high temperatures occurred in Bakersfield (although slightly shorter periods in locations elsewhere in the San Joaquin Valley). Triple digits had not been observed since May.

24th: Thunderstorm over the southern Sierra Nevada sparked a large wildfire (Shaeffer) in the higher elevations south of Sequoia National Park. The wildfire lasted for several weeks.

July- Overall, the month was characterized with very hot daytime temperatures and ended up well above average. All San Joaquin Valley stations reported a large number of highs above 100 degrees Fahrenheit (with daytime highs generally in the 90s or warmer for the entire month). The largest fire of the season (i.e., Detwiler Fire) in our forecast area was in Mariposa County and threatened thousands of residents, including in Mariposa and nearby communities.

9th: A strong, nearly stationary thunderstorm produced small hail and flash flooding over some of the roadways in and near Pine Mountain Club in southern Kern County. Thunderstorms and gusty winds developed over parts of Bakersfield due to this storm, but did not reach Meadows Field Airport (BFL).

August – Heat wave during last week of month; continued into early September. Highs reached above 110 degrees in the warmest locations (San Joaquin Valley and Kern County desert areas). Combined with persistent triple digit high temperatures in many locations and the heat wave, August was also much warmer than average.

25th – 31st: Record high temperatures reached in much of central California. Highs topped 110 degrees in many San Joaquin Valley and Kern County desert locations during this period (actually ended on September 2nd).

September- Numerous wildfires broke out in the mountains due to hot weather for the first part of the month. Temperatures were overall above average, but with above average precipitation, especially due to thunderstorm events during the early half of the month. Much cooler temperatures arrived by the third week. Thunderstorm winds made firefighting challenging at times, especially during the first half of the month.

1st & 2nd: Heat wave continues from August (highs near 110 degrees in warmest locations).

3rd: Isolated severe thunderstorms developed in Bakersfield during the late afternoon and continued north to Mariposa County and Yosemite National Park through the nighttime hours. Strong gusty winds were the main threat. A thunderstorm complex had developed over Bakersfield and moved north to Yosemite in about a five hour period and brought numerous challenges for firefighting of nearby ongoing wildfires due to strong, gusty winds and recent heat.

11th: Numerous strong thunderstorms produced a severe weather outbreak in the San Joaquin Valley and Kern County mountain/desert areas. Damage to power lines and structures was reported due to strong, gusty winds (ranging from 60 to 70 mph), especially in locations of the center part of the San Joaquin Valley such as Hanford, Corcoran, and Caruthers. Lightning damage to residences also occurred in northern sections of Hanford.

13th: During the late evening hours, thunderstorms brought around 0.50 inch (and likely heavier) in about 30 minutes in Bakersfield.

21st: A dusting of snow over the Sierra Nevada higher elevations (above 7,000 feet) due to a cold system from the Gulf of Alaska.

October – Overall slightly below average (north of Kern County) to slightly above average temperatures (in Kern County). An active fire season continued in the mountains throughout the month due to numerous offshore (easterly) wind events with low relative humidity. Below average precipitation accumulated throughout the region.

9th: Strong offshore wind event with gusty winds in Bakersfield, including gusts to 40 mph. Strong and gusty winds in the south end of the San Joaquin Valley near the mountains, including below the Grapevine where gusts reached 55 mph.

15th, 17th: Offshore winds brought highs in the upper 80s to around 90 in the southern San Joaquin Valley.

25th - 26th: Highs well above average (as high as the 90s in Bakersfield and quite a few other areas in Kern County) due to a strong ridge of high pressure and offshore wind pattern.

November – Much above average temperatures with mainly much below average precipitation, except near average precipitation in Mariposa and Merced Counties, as well as Yosemite National Park.

15th -17th: Atmospheric river over Yosemite and Merced/Mariposa Counties brought abundant rainfall and the first significant Sierra Nevada snow towards the end of the period at elevations above 6,000 feet (around 1-2 feet, and even higher at 8,000 feet, or around 2-3 feet). Elevations down to 4,000 feet received a dusting of snow by the 17th. This storm was enough to produce near average precipitation for the month in this section of Central California.

22nd-26th: Record high temperatures (including during the Thanksgiving holiday weekend). Highs reached as warm as the 80s in the Sierra Nevada foothills, as well as the San Joaquin Valley and Kern County mountain/desert areas, or as much as 20 degrees above average.

December- Below average precipitation was prevalent with above average temperatures. Very dry offshore flow pattern and persistent high pressure for much of the month. Morning low temperatures were generally below average in the San Joaquin Valley due to the dry air and relatively calm wind. Very little precipitation occurred throughout this month, including mountain snow.

5th – This date marked the first widespread freeze event in San Joaquin Valley for this year. Lows reached into the mid-20s in the coldest locations. Lows reached 26 degrees Fahrenheit in Madera and Merced, while the low was 28 degrees in Hanford. The first below freezing temperature in Bakersfield was reported for this year (with a low of 31 degrees); however, Fresno remained above freezing (until the 7th).

7th – First freezing low temperature (i.e., 32 degrees) in Fresno reported since February 24th.

21st - 22nd: Very cold morning lows occurred due to a strong cold front and northerly winds that originated from Canada. Lows reached into the mid to upper 20s in many San Joaquin Valley locations.

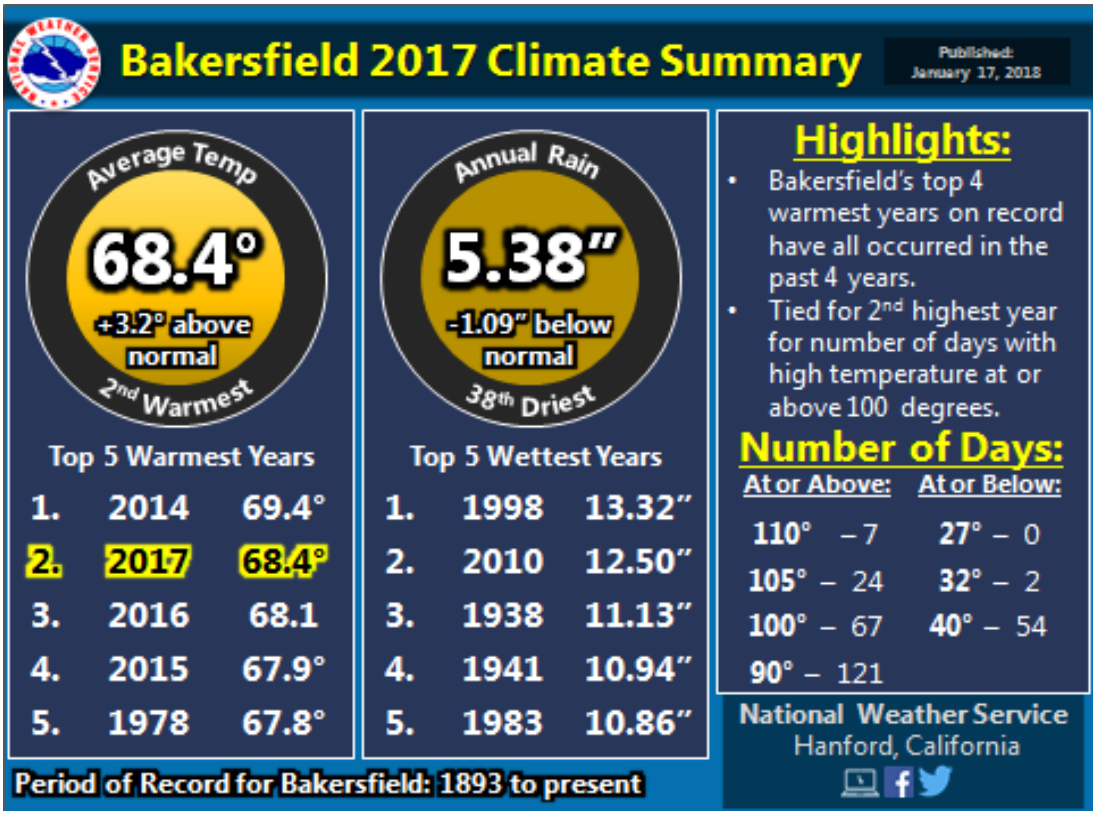
23rd -31st: More prolonged offshore wind events and warmer than average temperatures occurred during these periods in December. Very dry air in the mountains, including prolonged periods with relative humidity below 10 percent around 5,000 to 6,000 feet elevation and above. High pressure persisted for these periods over much of California.

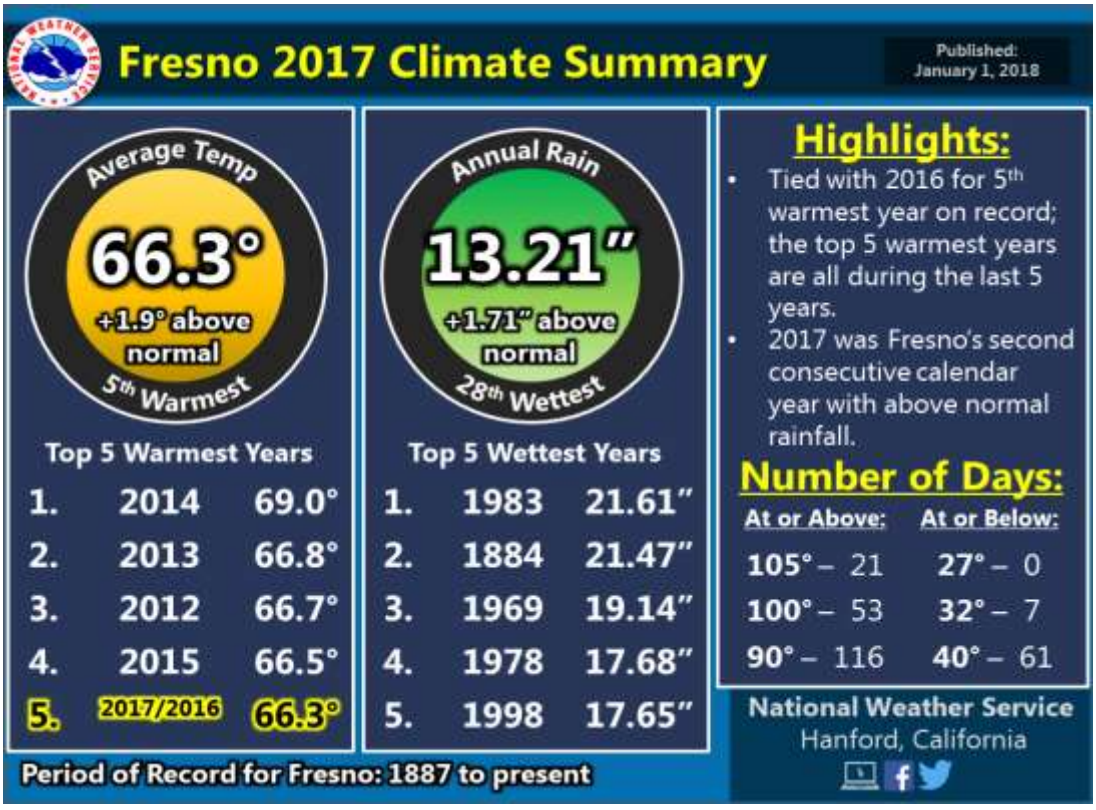
Summary of the Year

Overall, the year 2017 ended much warmer than average with near to above average precipitation. In terms of how warm it was this year, Bakersfield had its 2nd warmest year on record, and Fresno reached its 5th warmest. The last four years are now in the top 5 warmest years on record for both locations. Precipitation was around 115 percent of normal for the calendar year in Fresno and 83 percent of normal for Bakersfield. Precipitation at Hanford, Madera, and Merced was just above 100 percent of normal. The wettest period by far occurred during January and February. In contrast, a very dry end of the year ensued. The summer months were generally dry, except for September.

As a side note, mountain snowpack in the Sierra Nevada was well above average from January through much of June. At the stations that usually maintain snow records, amounts were near the highest ever recorded during this period, although it is entirely possible other locations may have received record amounts of snowfall.

Graphical Climate Summaries for Bakersfield, Fresno, Hanford, Madera, and Merced:





Hanford 2017 Climate Summary

Published: January 1, 2018

Top 5 Warmest Years

1.	2014	66.1°
2.	2015	65.5°
3.	2017	64.9°
4.	2016	64.7°
5.	2001	64.3°

Top 5 Wettest Years

1.	2010	13.88"
2.	2006	11.23"
3.	2001	9.67"
4.	2005	9.35"
5.	2017	8.75"

Period of Record for Hanford: 1998 to present

Highlights:

- 4th warmest year on record; the last 4 years are all the top 4 warmest years.
- 2017 was slightly above average in terms of rainfall, similar to the previous year.

Number of Days:

At or Above:	At or Below:
105° – 18	27° – 2
100° – 46	32° – 29
90° – 113	40° – 62

National Weather Service
Hanford, California

Madera 2017 Climate Summary

Published: January 1, 2018

Top 5 Warmest Years

1.	2014	65.4°
2.	2015	64.7°
3.	2017	64.5°
4.	2016	64.4°
5.	2012	62.9°

Top 5 Wettest Years

1.	2010	16.11"
2.	2006	13.41"
3.	2005	12.99"
4.	2016	12.47"
5.	2001	11.82"

Period of Record for Madera: 1998 to present

Highlights:

- 2017 was much above average in terms of temperature and reached 3rd warmest on record.
- A mainly average year for rainfall, though January was wettest on record & February was 2nd wettest).

Number of Days:

At or Above:	At or Below:
105° – 18	27° – 2
100° – 46	32° – 29
90° – 113	40° – 62

National Weather Service
Hanford, California

Merced 2017 Climate Summary

Published: January 1, 2018

Average Temp

63.3°

+1.6° above normal

4th Warmest

Top 5 Warmest Years

1.	2014	65.8°
2.	2012	64.2°
3.	2015	63.9°
4.	2017	63.3°
4.	2016	63.3°

Annual Rain

12.93"

+1.80" above normal

6th Wettest

Top 5 Wettest Years

1.	2010	16.92"
2.	2000	15.89"
3.	2016	15.21"
4.	2004	13.20"
5.	2005	13.01"

Period of Record for Merced: 1998 to present

Highlights:

- 2017 was above average in terms of rainfall, similar to the previous year.
- Tied for 4th warmest year on record with 2016.

Number of Days:

At or Above:	At or Below:
105° – 11	27° – 3
100° – 36	32° – 35
90° – 101	40° – 85

National Weather Service
Hanford, California